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## P R E F A C E.

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AS a Tribute of Respect to the Memory of his Grace the late Charles Duke of RICHMOND, K. G. F. R. and A. S. who was elected a Member of the Society in the year 1758, chosen a Vice-President in 1763, and who, for nearly fifty years, contributed to extend the sphere of its utility, by an annual Subscription of five Guineas, the Society instituted for the Encouragement of Arts, Manufactures, and Commerce, have embellished the present Volume with his Portrait, (drawn and engraved with the permission of his noble Successor,) by Mr. Evans, from a Painting executed by Romney.

A period of about fifty-four years has now elapsed since this Society first begun and since continued their attentions, to the various objects of the institution; and they trust that their present Volume will be found to contain much valuable information in the several departments under which their business is usually classed.

Under the Class of Agriculture, the Right Hon. the Earl of Mansfield will be found to have promoted the public

interest, by Planting 96,000 Oak Trees, which may contribute, at a future period, to the service of the Royal Navy, that Bulwark of the British Empire.

The Right Rev. the Lord Bishop of Llandaff, well known for his excellent chemical publications, has lately devoted some part of his leisure to the Planting of 322,500 Larch Trees, which afford useful, valuable, and durable timber.

The Right Hon. Lord Boringdon, by Embankments from the Sea, has gained two hundred and fifteen Acres of Land, which are already become valuable and productive.

Upon a similar plan, William Lawrence, Esq. of Maldon, in Essex, has gained a considerable Tract of Land, and has thus contributed much to the salubrity of that neighbourhood, by removing the morasses and stagnant pools of water which generally occasion the intermittent fevers prevalent in such situations.

The extensive Plantations of Fruit Trees, made at Hefleton, near Wareham, in Dorsetshire, by Dr. Baine, are planned and managed with great judgment. They are well deserving of inspection by all persons who have an opportunity of encouraging this branch of agriculture. They present to the eye great varieties of delightful scenery, highly interesting in every stage of their growth, and such as naturally

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turally tend to excite a stimulus in other persons to similar exertions ; they also prove the certainty of a very considerable profit soon arising from the timber.

To Mr. Charles Waistell, of High Holborn, the public are much indebted, for a very interesting communication of Methods to ascertain the Value of Growing Timber Trees, at different periods, with a number of useful Hints on the Means of promoting their Growth, and increasing their Value, derived from his actual observation and much attention ; and it is probable that the Tables he has given will be generally referred to, as the best examples of the kind hitherto made known.

Much light has been thrown on the Theory of Vegetation, by the very ingenious and extensive Experiments of John Christian Curwen, Esq. of Workington Hall, in Cumberland ; it seems evident from them, that the opening of the land by the plough, or other mechanical means, is useful not only in allowing the roots to extend themselves within the soil thus loosened, (a fact universally known, and hitherto regarded as the only cause of their improvement in growth,) but also acts in a manner heretofore unnoticed, namely, by promoting in dry seasons the evaporation of much moisture from the earth thus exposed to the action of the sun and air, and creating a pabulum for the plants, which absorbed by their leaves, renders them in a

high degree luxuriant and productive. He has so far extended his observations on this subject as to show, that the mode of depositing the manure for plants, may be made subservient to this principle, that equally good crops may be produced with a less quantity of it, and the land preserved in better tilth and condition, than the same land would be with a greater quantity of manure, managed by the common practice.

Robert Burrows, Esq. of Great Witchingham, in Norfolk, has been engaged in a very accurate and extensive course of Experiments respecting the Comparative Advantages of Wheat, as sown broadcast, drilled, or dibbled; he has minutely described every operation, and accurately stated the expence of each of these modes of culture, the nature of the soil, condition of the land, produce of the corn, and the quantity of the straw; he has drawn inferences from the products, of the advantages or disadvantages attending each mode of culture.

The Improvement of Waste and Uncultivated Land, by J. Butler, Esq. of Bramshott, in Hampshire, shows an extraordinary increase of value from his judicious management, he having, at a moderate expence, since the year 1804, rendered sixty-six acres of land, then worth only sixteen pounds seven shillings and sixpence per annum,

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now of the annual value of one hundred and forty-five pounds ten shillings.

Mr. Samuel Curtis, of Walworth, has lately planted a very extensive Orchard, containing above four thousand Fruit Trees of various kinds, which are placed with so much judgment, as to permit the land betwixt the rows of trees to be yet cultivated for a series of years, and to yield nearly as great crops, as if the fruit trees had not been planted.

The Foot Rot in Sheep has been found to be a troublesome and serious disease—the mode of cure pointed out by Mr. R. Parkinson, of Walworth, appears easy to execute, and by very respectable certificates, is stated to be found effectual.

Many valuable Cattle have been lost from eating too much moist clover grass, which, by fermenting in the stomach of the animal, furnishes so great a quantity of air as to occasion suffocation, if not timely disengaged. Two methods of relieving cattle hoven or swelled by this disorder, have been adopted; one of which is by passing a hollow flexible tube down the throat of the animal, and allowing the air to escape through it; the other is, by stabbing the beast through the hide into the stomach, and thence allowing the air a vent through the wound. Mr. William Wallis

Mason, of Goodrest - Lodge, near Warwick, has, instead of a knife, for this latter operation, successfully employed an instrument resembling that used by surgeons in tapping for the dropsy, known by the name of Trochar and Canula.

The usual mode of Churning Cream, to make Butter, is well known to be a laborious operation, but this labour is likely to be now considerably reduced, and the business facilitated, by the simple and ingenious invention of Mr. Thomas Fisher, of Ormskirk: the Head of his Churn-Staff has a rotatory motion upon a pivot at the bottom of the Staff, which completes the work sooner, and with more ease.

The Stall Feeding of Cattle, with a view to ascertain what breeds arrive at the earliest maturity, and have the greatest propensity to fatten, has been considered an object deserving much attention, and has induced the Society to offer two premiums for experiments in this line.

Under the Class of Chemistry, Mr. William Anderson, of his Majesty's Dock-Yard, at Portsmouth, has been rewarded for Improvements in Painting Canvas for Hammock Cloths, and other articles necessary to be guarded from Wet. His process comprizes the advantages of being cheap, soon executed, rendering the canvas pliant, durable,

ble, and longer impervious to water, than that heretofore adopted. He has also furnished some ingenious remarks on converting the colours of old painted canvas again to use.

The benefits arising from plenty of Vegetables as Stores on Shipboard, are too well known to require being expatiated upon, and preserved Fruits form a luxurious and wholesome addition to our repasts at home. The Process of Mr. Saddington, for the Preservation of an infinite Variety of Fruits, without Sugar, has a considerable similarity to some of the modes heretofore used, but he has reduced the plan of preserving fruit to so regular a system, and at so cheap a rate, as to render the communication a desirable circumstance to many persons who have met with serious disappointments in attempts for that purpose.

In the Class of Polite Arts, under pages 19 and 20, will be seen, from the various Rewards bestowed, that the Society have given great encouragement to the efforts of genius in young persons of both sexes, in order to form the taste of those who may in future become patrons of the arts, and to excite a laudable spirit of emulation amongst young professional artists. The very numerous and highly respectable company who attend the annual distribution of the Rewards of the Society, bear ample testimony of the heart-



heart-felt pleasure derived from contemplating the exertions of rising merit.

In the Class of Manufactures, the Society furnish one instance among many which this united empire affords, of the spirit with which its inhabitants meet the difficulties attempted to be thrown in their way by foreign powers. By the ports of the continent being closed against us, it was expected that our manufactures would be destroyed for want of raw materials on one hand, and for want of sales for our goods on the other. Our enemies had even contemplated, with pleasure, the distress which they expected to arise to our Navy from want of hemp for cables, ropes, and sail-cloth. At this juncture it has been shown, by the experiments of Mr. George Whitworth, of Cuxwold, that fifteen thousand tons of sheeps' wool may be annually advantageously devoted to the manufacture of articles heretofore usually made of hemp; thus furnishing employment to our manufacturers, encouraging and rewarding the farmers, increasing their attention to this article, and allowing the hemp necessarily imported to be exclusively devoted to the service of our Navy.

The ingenuity of our manufacturers in facilitating the detail of their business, is frequently displayed by improvements. The ingenious Implement lately invented by Mr. Peter Tansley, for cutting Shag Edgings, is simple  
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in construction, and affords great facility in executing the work.

Under the class of Mechanics many valuable discoveries are made known to the public, and very particular attention has been paid by the SOCIETY to reward such as are connected with advantages to the Navy. The Society are sensible that it demands the support of every man who has the interest of his country at heart, and they are anxious to contribute all the means in their power, of adding to its security, comfort, and success. Captain Bolton's highly valuable invention for forming ships Jury-masts when the original masts have been broken by storms, or in engagements, shows, that from the spare spars usually carried on board King's ships, and in every merchant ship that is properly equipped, Jury-masts may be constructed to carry securely as much sail as on the usual mast, and so as to enable the ships to prosecute their voyage with safety and without delay.

The improvement in anchors by Captain Ball, renders them more durable, and less liable to damage, than those made in the common way, and of course gives greater security to a ship. His double fish hooks for fishing the anchor effects that business with ease, and without the usual risk:

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The great scarcity of Oak timber for the Navy, is become a serious object of consideration, and every means for providing a substitute for its use is of much consequence. Mr. Roberts's invention of securing the ends of the beams of ships, by iron work instead of wooden knees, will be a saving in expence of three hundred pounds in the construction of every seventy-four gun ship. He has not only been rewarded by this Society, but after a series of trials this plan has been patronized by his Majesty and the Navy Board.

Telegraphic communication has been found of great use in this kingdom, and every means of facilitating correspondence upon this principle deserves attention. The inventions of Major Charles Le Hardy, of the Chevalier Edelcrantz, and of Mr. Henry Ward, all detailed in the present volume, show great ingenuity in effecting or assisting such communication.

In making inclosures of land great expence frequently arises from raising and removing large stones, partly exposed to view, and partly buried under ground ; the easy and simple mode by which Mr. Robert Richardson has effected this business, shows that things may actually be sometimes completely executed in a manner difficult to be accounted for theoretically.

Few

Few persons have escaped the unpleasant sensation of being exposed to the inconvenience of a great current of air between the bottom of a door and a fire-place. Mr. John Tadd's invention will obviate this evil, and allow the door to pass with ease over the floor carpet.

Various means have been attempted by Mechanics to make an universal Screw-Wrench, or an Instrument which could be fitted to the different sized Heads of Screws. The Implement invented for this purpose, by Mr. William Barlow, will be found ingenious, simple, and efficacious.

Few subjects have lately been more the topic of conversation, and of speculation, than the effects of Carbonated Hydrogen Gas, in lighting rooms, factories, or places of public resort. The communication produced to the Society by Mr. Clegg on this matter, will furnish to the public the means of executing plans of this kind, according to modes long established by him, and accurately described in the present volume.

The Society, ever alive to the calls of humanity, have rewarded Captain Manby, for his Improvement for forming a Connection with a Ship stranded, by means of a Rope thrown over the Vessel, from a Mortar on the Shore. From the Engravings and detailed Experiments  
given

given in the volume, the method is fully shown, and that it is likely to be the means of saving many a brave seaman from a watery grave. The public will no doubt unite in sentiment with the noble President of the Society, who declared, on presenting him with the Gold Medal, that he had great pleasure in observing, that the means which had heretofore been usually employed for the destruction of mankind, were now likely to be advantageously used by Captain Manby for their preservation.

The public will find, under the Class of Colonies and Trade, that attention has been paid to the Encouragement of the British Herring Fisheries, and from the opinions of persons conversant in the business, that the herrings cured by Mr. Errington, of Yarmouth, approach nearer in goodness to those of the Dutch, than any of the British cured white pickled herrings.

The Royal Botanical Garden of St. Vincent will be found to flourish under the superintendency and care of Dr. Alexander Anderson, who appears indefatigable in pursuit of the objects of that establishment. We greatly lament with him, that owing to difficulties at the Custom-house, many valuable Articles of Natural History are frequently lost or injured, and the kingdom deprived of products which would eventually improve its manufactures, and extend its commerce.

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The Communications from Dr. William Roxburgh, of Calcutta, show his accustomed zeal for promoting the interests of his native country, and the great resources to which it can have recourse, without resorting for assistance to other powers; it is a circumstance highly gratifying, to find that Canvas of very good quality for ship sails, can be furnished advantageously for the Navy, from our East India settlements, and that Hemp produced there, is reckoned equal, if not superior, to Russian Hemp.

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A perusal of the present Volume will convince the public, that the Society have paid great attention during their Session, to general Improvements in the Arts, Manufactures, and Commerce of the British Empire, for the promotion of which they were established, and they trust their labours will meet with general approbation.

The Meetings of the present Session commenced in October last, and are numerously attended; the business is conducted with their usual alacrity; and the Society are ever ready to patronise, not only the immediate objects of the Premiums they have offered, but are disposed to extend it to every other invention consistent with the plan of the institution.

The Society take the present opportunity of expressing their thanks to the several Public Bodies and individuals  
from

from whom they have received the sundry presents noted in this volume, and are particularly obliged to Alexander Mitchell, Esq. for the valuable additions to their library, with which he has favoured them from time to time, and hope that his example will be followed by other Members of the Society, and the Friends of this Establishment.

*The Society desire it to be clearly understood, that as a body they are not responsible for any opinion or representation of facts contained in the following pages. They have endeavoured only to compress, into a form more concise, such communications as appeared to them too diffuse when received.*

A great increase in the number of Members hath taken place during the last Session, and the Finances of the Society are in a very flourishing state. There is probably no other Institution in the world where the Members have such opportunities of acquiring useful knowledge, and enjoying such patronage and privileges. To every improvement or invention by which the happiness of mankind can be promoted, the Views of the Society are extended, and their Bounties and Rewards reach the remotest climates.

*Adelphi, London,  
Dec. 30, 1808.*